North Kinney Road Bridge
Over Brown Creek
Rock City vicinity
Rock Run Township
Stephenson County
Illinois

HAER No. IL-129

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
National Park Service
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HISTORIC AMERICAN ENGINEERING RECORD
NORTH KINNEY ROAD BRIDGE
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I. INTRODUCTION

Present Location:	North Kinney Road Spanning Brown Creek Three miles south and one mile east of Rock City, Illinois
USGS Quadrangle:	Ridott, Illinois Latitude 42°-21.44'; Longitude 89°-27.39' UTM 16.297700.4692160
Inventory Data:	North Kinney Road Bridge (Township Highway) Illinois Structure No. 089-3189 NE 1/4 of Sec 9, T27N, R9E Stephenson County
Date of Construction:	1910, accepted date, unconfirmed
Owner, Custodian:	Rock Run Township Highway Department
Present Use:	Vehicular bridge programmed for replacement in 1996.
Significance:	This single-span bridge over Brown Creek, a multi-beam concrete deck structure with interior rolled beams, fascia plate girders, lattice handrails and steel fabricated end-posts, is noteworthy among the twelve earliest structures of this type on the Illinois Inventory, as preserving original features without modification. It was built in the period when timber availability had declined and as improved steel and concrete opened a new era of bridge building for short spans. The builder may have been W.H. Shons.
Historian:	John B. Nolan, S.E. 23 August 1995

II. HISTORY

Brown Creek, a small perennial stream in the hills of northeastern Stephenson County, flows generally southerly into Rock Run, which soon joins the Pecatonica River. The Pecatonica, a major drain for eastern Stephenson County, flows northeasterly into the Rock River. The Brown Creek and Rock Run watersheds are undulating topography, the southern fringe of the Wisconsin dairy and cheese area, with the substantial farmsteads and barns associated with that industry.[1]

Stephenson and Jo Daviess county, to the west, were bypassed by the most recent glaciers, leaving a rugged terrain unmatched elsewhere in Illinois. Melt water streams form an erratic pattern of topography. Meeting in Stephenson County are the prairies of Illinois and the timbered regions of Wisconsin.[2]

In the 1830s two well used trails passed through Stephenson County. Entering from the east and following the south edge of the Pecatonica River was the stage route from Chicago and Rockford, which continued westerly with a northerly swing across the county toward Galena and its lead mines. Diagonally near the northern edge was the "Old North Side of The County" main road connecting Rockford with the lead mines at Mineral Point, Wisconsin.[3]

In the latter years of the 1830s and early 1840s the commissioners ordered numerous roads surveyed to complete the network and connections. One such road, connecting Farwell and Turner's Mill on the Pecatonica with Rock Grove on the north county road, crossed Brown Creek near the location of the future North Kinney Road Bridge.[4]

When the first County Plat Book was published in 1871, virtually all of this road network had disappeared. The need for through roads vanished with the coming of railroads in the 1850s, as most through traffic moved by train. In addition, the agricultural revolution brought increased mechanism and the desirability of fields with square corners. Thus were roads shifted to the section lines, a shift encouraged by the coming of township organizations In 1849.[5]

The 1894 Plat Book shows A. Kinney as the owner of 108 acres south of the bridge site. The Kinney family arrived in the area in 1838, Newcomb Kinney serving on the first county grand jury in that year. North Kinney Road, with a gravel and oil surface, has a total length of two and a half miles. It is paralleled by County Highway 10, one mile to the west, which connects Ridott and Rock Run. A small quarry in the slope southeast of the bridge is noted on the map. No evidence remains of the five mills which stood on Rock and Brown Creeks in the early days of settlement.[6]

No record of building the Kinney Road bridge, 24 feet in length, has been found in the minutes of the County Board of Supervisors' quarterly meetings. However, the contracting for three other bridges, built in Rock Run Township about the same time, is recorded:[7]

November 1912:
Decision made in September 1912 to build two bridges in Rock Run Township
Size: 30 feet
Builder: W.H. Shons
Cost: $2,359

June 1914:
Decision made to build a bridge in Rock Run Township in August 1913
Size: 30 x 16 feet
Builder: W.H. Shons
Cost: $1,100

September 1914:
Decision made to build a culvert in Rock Run Township
Size: 8 feet (culvert)
20 feet (roadway)
28 feet (wings)
Builder: W.H. Shons
Cost: $389

An estimated cost for the Brown Creek Bridge, constructed in 1910 on masonry abutments, would be around $1000. The abutments are block supports without visible wings and may date from an earlier bridge. It is possible but questionable that the builder was W.H. Shons. It is reported that the Supervisors' minutes include numerous other bridges built in adjacent townships during that time period.

III. THE BRIDGE

A. The Bridge Type

The single span of the North Kinney Road bridge is a multi-beam bridge with a concrete deck, built-up fascia girders supporting, on the upper flange, a lattice railing, and distinctive fabricated end posts. The bridge has a total length of 24'-0" and a roadway width of 16'-6".

Although a few stone arch bridges were built on the earliest major roads, the first bridges on secondary roads, where timber was available, were would have been of oak or walnut logs or hewn timbers with an added plank flooring. On low grade roads timber bridges were common and economical into the 1890s.[8]

Fortunately, as the availability of timber decreased, steel and a new building material, concrete, were becoming economical. Bridge design and construction were now being handled by professionals,and specifications were becoming codified. A 1906 report of the first Illinois Road Commission urged uniformity in design and the development of experienced contractors.[9]

The earliest steel multi-beam, concrete deck bridges in the Illinois bridge inventory, built 1891 and 1895, are located in Jackson Park, Chicago, and were built to serve during or for relandscaping the grounds after the 1893 World Columbian exposition. A third bridge was built in 1895 as part of the Hennepin Canal system.[10]

Eight other early multi-beam bridges are listed. These structures, built between 1901 and 1910, have span lengths ranging from 13 to 36 feet, and are located on secondary roads.[11]

B. The Builder

The builder has not been verified. Many early concrete bridges in Stephenson County were built by W.H. Shons, a contractor, who, with his sons, Ferral and Kenneth, specialized in building bridges from 1900 to 1925. In 1919, Mr. Shons built the first all concrete bridge in the County.[12]

The carefully detailed steel endposts and railings on the North Kinney Road bridge appear to indicate a contractor familiar with steel fabrication. Unfortunately local histories do not list a likely builder residing in the county.

C. Structure Description

The North Kinney Road Bridge is built at right angles to Brown Creek, having its centerline skewed an estimated 20° to the right.

For a sketch showing details of this multi-beam bridge, prepared by Boyer Engineering, Ltd., see page 9.[13]

Superstructure:

One Span: total length 24'-0"; deck length 22'-0"; roadway width 16'-5"; waterway width 14'-5".

Seven rolled interior beams: web 12"x1/4; flange 5"x7/16"; beams spaced at 2'-1".

Fascia girders: web 24"x1/4"; flange angles 3"x3"x1/2", lower interior angle is inverted; web stiffener angles, 3"x3"x1/2" (non-bearing), approx. 30" from girder end on outside, appear to have been added later. Guider bearing details are unavailable.

Concrete deck, 4", poured on tops of interior beam flanges; earth and gravel, about 4".

Lateral cross-bracing: double system, 1" dia. rods, loop ends, pinned to bottom flange of girder at midspan. (Pin between upside flange angle and pin plate, 1/2", riveted to lower flange).

Lattice Railing:

Continuous into end posts, about 23' 11-1/2"; 32" above the fascia girder flanges; 28" back-to-back of flanges; double angle flanges 1-3/4"x1-3/4"x3/16".

Diagonal lattice bars 1-1/4"x 1/8"; right angle intersections at 9"; fastened with 3/8" dia. rivets.

End Posts:

Ends of railings and fascia girders are encapsulated in fabricated stanchions tapering from the girder flanges to the top angles of the lattice rail. Stiffened on each edge with channels 4"x1-1/2", flanges outward and bent to slope from 10" wide at the fascia girder flanges to 3-1/2" at the top, to support the ends of the top pair of railing angles. An end plate on the post, 1/4", is riveted to the nearest channel flanges; the 10" width is believed to extend to the bottom flanges and bearing seat.

Substructure:

Original limestone masonry wall abutments, approximately 3'-6" x 18'-0" of unknown depth and without visible wings. Additional concrete supporting walls have been added to the faces. Tops of added concrete protection are approximately 1'-6" below the fascia girder, thicknesses approximately 1'-0" on North and 2'-0" on South.

D. Present Condition And Modification

Little maintenance has been necessary on this bridge. The lattice railing is intact but the southeast endpost has been impacted. The concrete deck is covered with 3 to 6 inches of roadway gravel and earth. There is no record of when the web stiffeners and concrete wall protection were added.[14]

The bridge has an operating rating of HS 29.4, equivalent to a combination vehicle weighing 53 tons. Although of substandard width, there is no one-way posting due to the limited traffic.

Although the bridge's load carrying capacity is adequate, its substandard width effectively limits the upgrading of North Kinney Road in the future.

IV. END NOTES

[1]In the Footprints of the Pioneers of Stephenson County, Illinois (Freeport, Illinois: The Pioneer Publishing Co., 1900) pp. 1,2; Mary K. Barnett, ed., History of Stephenson County, 1970 (Freeport: County of Stephenson, 1972) p. 1.

[2]Christopher J. Schuberth, A View of the Past: An Introduction to Illinois Geology (Springfield: Illinois State Museum, 1986) p. 139; Barnett, p. 1.

[3]Philip L. Keister, Stephenson County Roads (Stephenson County Historical Society) p. map.

[4]Ibid.

[5]Combination Atlas Map of Stephenson County, Illinois (Geneva, Illinois, Thompson and Everts, 1871); Ibid., pp. 21ff.

[6]F. Bourguin, Plat Book of Stephenson County, Illinois (Philadelphia, Northwest Publishing Co., 1894); Keister, p. 19.

[7]Stephenson County Board of Supervisors' Proceedings (Northern Illinois University, Illinois Regional Archives Depository (IRAD).

[8]James L. Cooper, Iron Monuments to Distant Posterity, Indiana's Metal Bridges, 1870-1930 (DePauw University and others, 1987) pp. 1ff.

[9]Illinois Highway Commission Report (Springfield: State of Illinois, 1906) pp. 55ff.

[10]Illinois Department of Transportation (IDOT), Historic Bridge Survey List. (Springfield: Bureau of Location and Environment, 1992) p. 3021m.

[11]Ibid., pp. 3021m, 3021a.

[12]Barrett, pp, 261, 514.

[13]Boyer Engineering Ltd., bridge details sketch; measurements by author, June 9, 1995, verified by bridge rating computations, IDOT Bureau of Bridges and Structures.

[14]Conversation: David Weaver, Asst. County Engineer, August 18, 1995.

[15]Ibid.

V. ADDITIONAL REFERENCES

A. Books

Darnell, Victor C. Directory of American Bridge Building Companies, 1840-1990. Washington D.C.: Society for Industrial Archaeology, 1984. (An authoritative source book published by a branch of the Smithsonian Institution.)

Ketchum, Milo S., C.E. Structural Engineers' Handbook. Chicago: McGraw-Hill, 1924. (An early classic on bridge design practices, originally published in 1908.)

Plowden, David. Bridges: The Spans of North America. New York: Viking Press, 1974. (An overview and illustrated history of the advancement and romance of bridge building.)

B. Library Resources

Illinois Regional Archives Depository (IRAD)
Regional History Center
Swen Parson Hall
Northern Illinois University
DeKalb, IL 60115
(Kimberly E. Dvorak, IRAD Intern, researcher)

Illinois State Historical Library
Old Capitol Square
Springfield, Illinois 62756
Telephone 217-524-6358
(Local histories)

C. Conversations

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D. Sketch of North Kinney Road Bridge Details:

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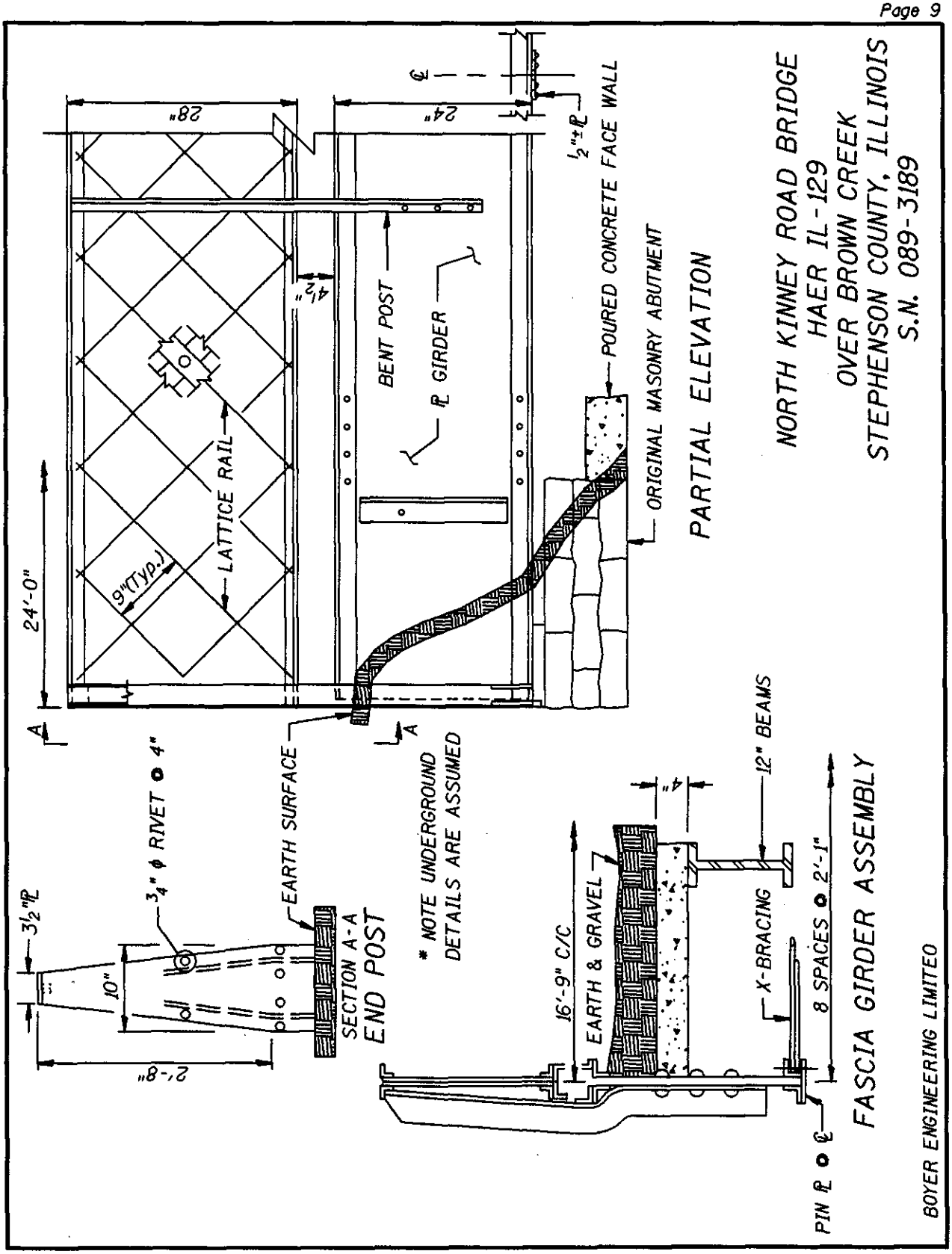
NORTH KINNEY ROAD BRIDGE
HAER IL-129
OVER BROWN CREEK
STEPHENSON COUNTY, ILLINOIS
S.N. 089-3189
PARTIAL ELEVATION
FASCIA GIRDER ASSEMBLY
BOYER ENGINEERING LIMITED
24'-0"
9"(Typ.)
LATTICE RAIL
BENT POST
℄ GIRDER
ORIGINAL MASONRY ABUTMENT
POURED CONCRETE FACE WALL
½"± ℄
28"
24"
4½"
℄
A
A
EARTH SURFACE
* NOTE UNDERGROUND DETAILS ARE ASSUMED
SECTION A-A
END POST
3½" ℄
¾" ϕ RIVET @ 4"
10"
2'-8"
16'-9" C/C
EARTH & GRAVEL
4"
12" BEAMS
X-BRACING
8 SPACES @ 2'-1"
PIN ℄ @ ℄